

Claims

We claim:

5           1. A container for product, comprising:  
a container body defining a space for storage of the product;  
a valve in fluid communication with the space; and  
a hollow stem in fluid communication with the valve and having an  
exterior end that has at least one side opening therethrough wherein the valve is  
10 actuatable to dispense product through the side opening.

2. The container of claim 1, wherein the exterior end includes a  
profiled end surface that defines the at least one side opening.

15           3. The container of claim 2, wherein the profiled end surface forms  
a slot.

4. The container of claim 3, wherein the slot defines first and  
second side openings.

20           5. The container of claim 4, wherein each of the first and second  
side openings is defined by a base surface and a pair of side surfaces

6. The container of claim 5, wherein the side surfaces are  
25 substantially perpendicular to the base surface.

7. The container of claim 6, wherein the side surfaces are disposed  
at angles other than 90 degrees with respect to the base surface.

30           8. The container of claim 2, wherein the profiled end surface forms  
a crenellated section.

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9. The container of claim 2, wherein the profiled end surface forms a zig-zag section.

10. The container of claim 2, wherein the profiled end surface forms  
5 a sinusoidal section.

11. The container of claim 1, wherein the at least one side opening is defined by at least one wall substantially completely surrounding the opening.

10                   12. The container of claim 11, wherein the at least one side opening  
is circular in shape.

13. The container of claim 11, wherein the at least one side opening is non-circular in shape.

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14. A container for use with dispensing apparatus that dispenses pressurized product stored in the container, comprising:

a container body defining a space for storage of the product;

a valve in fluid communication with the space; and

5 a hollow stem in fluid communication with the valve and having an exterior end that has at least one side opening therethrough and wherein the stem is adapted for engagement with the apparatus to permit dispensing of product through the at least one side opening into the dispensing apparatus.

10 15. The container of claim 14, wherein the exterior end includes a profiled end surface that defines the at least one side opening.

15 16. The container of claim 15, wherein the profiled end surface forms a slot.

17. The container of claim 16, wherein the slot defines first and second side openings.

18. The container of claim 17, wherein each of the first and second 20 side openings is defined by a base surface and a pair of side surfaces

19. The container of claim 18, wherein the side surfaces are substantially perpendicular to the base surface.

25 20. The container of claim 19, wherein the side surfaces are disposed at angles other than 90 degrees with respect to the base surface.

21. The container of claim 15, wherein the profiled end surface forms a crenellated section.

30 22. The container of claim 15, wherein the profiled end surface forms a zig-zag section.

23. The container of claim 15, wherein the profiled end surface forms a sinusoidal section.

24. The container of claim 14, wherein the at least one side opening 5 is defined by at least one wall substantially completely surrounding the opening.

25. The container of claim 24, wherein the at least one side opening is circular in shape.

10 26. The container of claim 24, wherein the at least one side opening is non-circular in shape.

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27. A combination, comprising:

a dispensing apparatus adapted to dispense product and having a coupling assembly and a dispenser inlet valve; and  
a container of pressurized product disposed in the dispenser and  
5 engaged by the coupling assembly;

wherein the container includes a container body defining a space for storage of the product, a container valve in fluid communication with the space and a hollow stem in fluid communication with the valve wherein the hollow stem has an exterior end that has at least one side opening therethrough and wherein the hollow  
10 stem is adapted for engagement with the dispenser inlet valve to permit dispensing of product through the at least one side opening into the dispensing apparatus.

28. The combination of claim 27, wherein the hollow stem includes a profiled end surface and a main body portion and wherein the coupling assembly  
15 includes a first sealing element engageable with the main body portion and a second sealing element engageable with the end surface.

29. The combination of claim 28, wherein the second sealing element is spring-biased and movable from a closed position to an open position  
20 when engaged by the valve.

30. The combination of claim 29, wherein the second sealing element includes a substantially spherical sealing surface.

25 31. The combination of claim 30, wherein the first sealing element forms a part of a hollow collar assembly having an interior chamber within which the second sealing element is disposed.

32. The combination of claim 31, wherein the collar assembly includes a first tapered surface and the main body portion of the valve includes a second tapered surface engageable with the first tapered surface to seal the interior chamber.

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33. The combination of claim 32, wherein the first tapered surface and the second tapered surface are tapered at different angles.

34. The combination of claim 27, wherein the exterior end includes a  
10 slot that defines first and second side openings.

35. The combination of claim 34, wherein each of the first and second side openings is defined by a base surface and a pair of side surfaces substantially perpendicular to the base surface.

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36. The combination of claim 34, wherein each of the first and second side openings is defined by a base surface and a pair of side surfaces disposed at angles other than 90 degrees with respect to the base surface.

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37. The combination of claim 28, wherein the profiled end surface forms a crenellated section.

38. The combination of claim 28, wherein the profiled end surface forms a zig-zag section.

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39. The combination of claim 28, wherein the profiled end surface forms a sinusoidal section.

40. The combination of claim 27, wherein the at least one side  
30 opening is defined by at least one wall substantially completely surrounding the opening.

41. The combination of claim 40, wherein the at least one side opening is circular in shape.

42. The combination of claim 40, wherein the at least one side opening is non-circular in shape.

43. The combination of claim 27, wherein the dispensing apparatus further includes a door movable to an open position wherein the container may be inserted into or removed from a recess of the dispenser when the door is in the open position.

44. The combination of claim 43, wherein the door includes walls that engage the container when the door is moved away from the open position toward a closed position as the container is being inserted into the recess.

45. The combination of claim 44, wherein the door includes a hinge.

46. The combination of claim 45, wherein a heater plate is disposed within the container body and wherein the plate is in contact with a heat exchanger.

47. A method of dispensing a heated gel, the method comprising the steps of:

providing a housing having a recess therein and a heater assembly disposed in the housing wherein the heater assembly includes a heater selectively operable to develop heat and a heat exchanger in heat transfer relationship with the heater and having a chamber, the heater assembly further including a first valve in fluid communication with the chamber and a second valve operable to permit fluid flow out of the chamber;

5 providing a container of pressurized gel, the container including a third valve and a hollow stem in fluid communication with the third valve and having at least one side opening therethrough;

10 placing the hollow stem in fluid communication with the first valve; opening the first and third valves to expose the chamber to pressurized

15 gel; and

15 opening the second valve to allow dispensing of gel without substantial foaming.

48. The method of claim 47, wherein the step of placing the hollow stem comprises the step of inserting the container in the recess until a coupling ring 20 engages a coupling cap carried by the container.

49. The method of claim 48, wherein the coupling ring is urged toward a particular position by a force exerted by a spring and wherein the step of inserting includes the step of exerting pressure on the can to displace the coupling 25 ring against the force exerted by the spring until the coupling ring travels over a flange of the coupling cap and is moved toward the particular position by the force exerted by the spring.

50. The method of claim 47, wherein the step of opening the first 30 and third valves includes the step of maintaining the second valve in a closed condition during the opening of the first and third valves.

51. The method of claim 47, wherein the step of providing the container includes the step of forming a profiled end surface in an exterior end of the hollow stem wherein the profiled end surface defines the at least one side opening.

5 52. The method of claim 51, wherein the profiled end surface forms a slot.

10 53. The method of claim 52, wherein the slot defines first and second side openings.

15 54. The method of claim 53, wherein each of the first and second side openings is defined by a base surface and a pair of side surfaces

20 55. The method of claim 54, wherein the side surfaces are substantially perpendicular to the base surface.

25 56. The method of claim 54, wherein the side surfaces are disposed at angles other than 90 degrees with respect to the base surface.

30 57. The method of claim 51, wherein the profiled end surface forms a crenellated section.

35 58. The method of claim 51, wherein the profiled end surface forms a zig-zag section.

40 59. The method of claim 51, wherein the profiled end surface forms a sinusoidal section.

45 60. The method of claim 47, wherein the at least one side opening is defined by at least one wall substantially completely surrounding the opening.

50 61. The method of claim 60, wherein the at least one side opening is circular in shape.

62. The method of claim 60, wherein the at least one side opening is non-circular in shape.

5 63. The method of claim 47, wherein the pressurized gel includes a propellant and a soap and wherein a ratio of soap to propellant is about six or more parts of soap to one part of propellant by weight.

10 64. The method of claim 47, wherein the pressurized gel includes a propellant in a range between about 0.25 percent and about 3.50 percent by weight of a total composition of the gel.

15 65. The method of claim 64, wherein the propellant is about 2.25 percent by weight of the total composition of the gel.

66. The method of claim 47, wherein the pressurized gel includes a propellant having a vapor pressure less than or equal to about 40 psia.

20 67. The method of claim 66, wherein the propellant has a vapor pressure of about 33.7 psia.

25 68. The method of claim 47, wherein the housing further includes a door movable between an open position exposing the recess and a closed position closing off the recess wherein the door includes a wall and wherein the step of placing includes the further steps of moving the door to the open position, inserting the container into the exposed recess and closing the door when the container is partially inserted into the recess such that the wall engages the can and forces the can fully into the recess.

30 69. The method of claim 47, wherein the pressurized gel includes a single propellant.

70. The method of claim 69, wherein the single propellant comprises isopentane.

71. A shave gel, comprising:  
a mixture of a soap and a propellant, wherein a ratio of soap to  
propellant is about six or more parts of soap to one part of propellant by weight and  
wherein the propellant is in a range between about 0.25 percent and about 3.50  
5 percent by weight of a total composition of the gel and the propellant has a vapor  
pressure less than or equal to about 40 psia.

72. The shave gel of claim 71, wherein the propellant is about 2.25  
percent by weight of a total composition of the gel.

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73. The shave gel of claim 72, wherein the vapor pressure of the  
propellant is equal to about 33.7 psia.

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74. The shave gel of claim 73, in combination with a container that  
stores the gel under pressure.

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75. The shave gel of claim 74, further in combination with a  
dispenser that receives the container and wherein the dispenser includes a heater  
assembly that heats the shave gel.

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76. The shave gel of claim 75, wherein the dispenser includes a first  
valve in fluid communication with the container, a heat exchanger in fluid  
communication with the first valve and a second valve in fluid communication with  
the heat exchanger wherein shave gel is disposed in the heat exchanger under  
pressure.

77. The shave gel of claim 71, wherein the shave gel includes a  
single propellant.

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78. The shave gel of claim 77, wherein the single propellant  
comprises isopentane.